



#3

RB-125-SEQ SEQUENCE LISTING

Sequence File Name: RB125seq.txt

<110> Horwath, K. L. and Easton, C. M.

<120> Nucleic Acid Sequences Encoding Type III Tenebrio Antifreeze Proteins and Method for Assaying Activity.

<130> RB-125-SEQ

<140> 09/876,796

<141> 2001-06-07

<150> 60/210,446

<151> 2000-06-08

<160> 48

<170> Microsoft Word

<210> 1

<211> 19

<212> PRT

<213> Tenebrio molitor

<223> N-terminal sequence of protein Tm 12.86

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1 5 10 15

Gln Gln Val
19

<210> 2

<211> 576

<212> DNA

<213> Tenebrio molitor

<223> Non-his-tagged, signal plus, Tm 13.17

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Met Lys Leu Leu
-15

tgt tgt cta atc tcc ctc att ctg ttg gtc,aca gtt cag gcc ctg 91
Cys Cys Leu Ile Ser Leu Ile Leu Leu Val Thr Val Gln Ala Leu
-10 -5 1

acc gag gca caa att gag aaa ctg aac aag atc agc aaa aaa tgt 136
Thr Glu Ala Gln Ile Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys
5 10 15

caa aat gaa agt gga gtg tcg caa gag atc ata acc aaa gct cgc 181
Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala Arg
20 25 30

aac ggt gac tgg gag gac gat cct aaa ctg aaa cgc caa gtt ttt	226	
Asn Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe		
35	40	45
tgc gtg gcc agg aac gcc ggt ctg gcc acg gaa tcg gga gag gtg	271	
Cys Val Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val		
50	55	60
gtg gtc gac gtg ttg agg gag aag gtg agg aag gtc act gac aac	316	
Val Val Asp Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn		
65	70	75
gac gaa gaa act gag aaa atc atc aat aag tgc gcc gtc aag aga	361	
Asp Glu Glu Thr Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg		
80	85	90
gat act gtt gaa gag acg gtg ttc aat act ttc aaa tgt gtc atg	406	
Asp Thr Val Glu Glu Thr Val Phe Asn Thr Phe Lys Cys Val Met		
95	100	105
aaa aac aag cca aag ttc tca cca gtt gat tga accaccacga	449	
Lys Asn Lys Pro Lys Phe Ser Pro Val Asp		
110	115	
ctagtagatg gttcaaatgg tttgtgtttac atataaaat aaagtgtttc	499	
tgtatgtaaaa aaaaaaaaaa aaaaaaaaaa aactcgagag tattctagag	549	
cggccgcggg cccatcgttt tccaccc	576	

<210> 3			
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<212> PRT			
<213> Tenebrio molitor			
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<223> Precursor Protein for Tm 13.17			
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1	5	10	
Lys Cys Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala			
15	20	25	30
Arg Asn Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe			
35	40	45	
Cys Val Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val			
50	55	60	
Val Asp Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu			
65	70	75	

Glu Thr Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val
80 85 90

Glu Glu Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro
95 100 105 110

Lys Phe Ser Pro Val Asp
115

<210> 4
<211> 116
<212> PRT
<213> Tenebrio molitor

<223> Mature Protein for Tm 13.17

<400> 4
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Gln Asn Glu Ser Gly Val Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn
20 25 30

Gly Asp Trp Glu Asp Asp Pro Lys Leu Lys Arg Gln Val Phe Cys Val
35 40 45

Ala Arg Asn Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp
50 55 60

Val Leu Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr
65 70 75 80

Glu Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu
85 90 95

Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys Phe
100 105 110

Ser Pro Val Asp
115

<210> 5
<211> 481
<212> DNA
<213> Tenebrio molitor

<223> Non-His-tagged, Signal plus, Clone 2.2

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atc gtc atc gga gct cag gct ctc acc gac gaa cag ata cag aaa 91
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp-Glu Gln Ile Gln Lys

-5	1	5	
agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg tcc			136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser			
10	15	.	20
caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gat gat			181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp			
25	30	35	
ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga			226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly			
40	45	50	
gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc			271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala			
55	60	65	
aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc gtg			316
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val			
70	75	80	
cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat			361
Gln Lys Cys Val Val Lys Ala Thr Pro Glu Glu Thr Ala Tyr			
85	90	95	
gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct			406
Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro			
100	105	110	
att gat taa ttgtttgtta tttgactgaa ttttgacaat aaaggtaata			455
Ile Asp			
115			
tcgttatgtta aaaaaaaaaa aaaaaa			481
<210> 6			
<211> 482			
<212> DNA			
<213> Tenebrio molitor			
<223> Non-His-tagged, Signal plus, Clone 2.3			
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-15		-10	
atc gtc atc gga gct cag gct ctc acc gac gaa cag ata cag aaa			91
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys			
-5	1	5	
agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg tcc			136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser			
10	15	20	

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat	181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp	
25 30 35	
ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga	226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly	
40 45 50	
gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc	271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala	
55 60 65	
aag ctg aag cat gtg gcc agc gac gaa gtg gac aag atc gtg	316
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val	
70 75 80	
cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat	361
Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr	
85 90 95	
gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct	406
Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro	
100 105 110	
att gat taa ttgtttgtta tttgactgaa ttttgacaat aaaggtacta	455
Ile Asp	
115	
tcgttatgaa aaaaaaaaaa aaaaaaaaaa	482

<210> 7	
<211> 133	
<212> PRT	
<213> Tenebrio molitor	
<223> Precursor Protein for Tm 12.84, Clones 2.2, 2.3, and 7.5	
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Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys	
1 5 10	
Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val	
15 20 25 30	
Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu	
35 40 45	
Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn	
50 55 60	
Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu	
65 70 75	
Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu	

80

85

90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp
95 100 105 110

Phe Ser Pro Ile Asp
115

<210> 8

<211> 115

<212> PRT

<213> Tenebrio molitor

<223> Mature Protein for Tm 12.84, Clones 2.2, 2.3, and 7.5

<400> 8

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Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val Arg Thr
20 25 30

Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu Cys Phe
35 40 45

Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu
50 55 60

Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp
65 70 75 80

Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr
85 90 95

Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser
100 105 110

Pro Ile Asp
115

<210> 9

<211> 481

<212> DNA

<213> Tenebrio molitor

<223> Non-His-tagged, Signal plus, Clone 3.4

<400> 9

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Met Lys Leu Leu Cys Phe Ala Phe Ala Ala
-15 -10

atc gtc atc gga gct cag gct ctc acc gac gaa cag ata cag aaa 91
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys
-5 1 5

agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg tcc 136
 Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser
 10 15 20

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat 181
 Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp
 25 30 35

ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga 226
 Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly
 40 45 50

gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271
 Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala
 55 60 65

aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc gtg 316
 Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val
 70 75 80

cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361
 Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr
 85 90 95

gac acc ttc aag gtt att tac gac agt aaa cct gat ttc tct cct 406
 Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro
 100 105 110

att gat taa ttgtttgtta tttgactgaa ttttgacaat aaaggtacta 455
 Ile Asp
 115

tcgttatgtta aaaaaaaaaa aaaaaa 481

<210> 10
 <211> 133
 <212> PRT
 <213> Tenebrio molitor

<223> Precursor Protein for Clone 3.4

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 1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val
 15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu
 35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn

50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu
65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu
80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp
95 100 105 110

Phe Ser Pro Ile Asp
115

<210> 11
<211> 115
<212> PRT
<213> Tenebrio molitor

<223> Mature Protein for Clone 3.4

<400> 11
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1 5 10 15

Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val Arg Thr
20 25 30

Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu Cys Phe
35 40 45

Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu
50 55 60

Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp
65 70 75 80

Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr
85 90 95

Ala Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser
100 105 110

Pro Ile Asp
115

<210> 12
<211> 482
<212> DNA
<213> Tenebrio molitor

<223> Non-His-tagged, Signal plus, Clone 3.9

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-15	-10		
atc gtc atc gga gct cag gct ctc acc gat gaa cag ata cag aaa	91		
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys			
-5	1	5	
agg aac aag atc agc aaa gaa tgc cag cag gag tcc gga gtg tcc	136		
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val Ser			
10	15	20	
caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat	181		
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp			
25	30	35	
ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aga act gga	226		
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Arg Thr Gly			
40	45	50	
gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc	271		
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala			
55	60	65	
aag ctg aag cat gtg gcc agc gac gaa gta gac aag atc gtg	316		
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val			
70	75	80	
cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat	361		
Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr			
85	90	95	
gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct	406		
Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro			
100	105	110	
att gat taa ttgtttgtta tttgactgaa ttttgacaat aaaggacta	455		
Ile Asp			
115			
tcgttatgaa aaaaaaaaaa aaaaaaaaa	482		
<210> 13			
<211> 133			
<212> PRT			
<213> Tenebrio molitor			
<223> Precursor Protein for Clone 3.9			
<400> 13			
Met Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala			
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Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys			
1	5	10	
Glu Cys Gln Gln Glu Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val			

15	20	25	30
Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu			
35	40	45	
Cys Phe Ser Lys Arg Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn			
50	55	60	
Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu			
65	70	75	
Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu			
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Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp			
95	100	105	110
Phe Ser Pro Ile Asp			
115			

<210> 14			
<211> 115			
<212> PRT			
<213> Tenebrio molitor			
<223> Mature protein for Clone 3.9			
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Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu Cys Phe			
35	40	45	
Ser Lys Arg Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu			
50	55	60	
Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp			
65	70	75	80
Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr			
85	90	95	
Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser			
100	105	110	
Pro Ile Asp			
115			
<210> 15			
<211> 481			
<212> DNA			

<213> Tenebrio molitor

<223> Non-his-tagged, Signal plus, Clone 7.5

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-15 -10

atc gtc atc gga gct cag gct ctc acc gac gaa cag ata cag aaa 91
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys
-5 1 5

agg aac aag atc agc aaa gag tgc cag cag gtg tcc gga gtg tcc 136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser
10 15 20

caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac gat 181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp
25 30 35

ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act gga 226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly
40 45 50

gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc 271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala
55 60 65

aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc gtg 316
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val
70 75 80

cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat 361
Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr
85 90 95

gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct cct 406
Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro
100 105 110

att gat taa ttgtttgtta tttggctgaa ttttgacaat aaaggtacta 455
Ile Asp
115

tcgttatgtta aaaaaaaaaa aaaaaa 481

<210> 16

<211> 681

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, Signal plus, Clone 2.2

<400> 16

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agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly -45	-40	-35	141
gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg Gly Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met -30	-25	-20	186
aaa ctc ctc ttg tgc ttt gcg ttc gcc gcc atc gtc atc gga gct Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala -15	-10	-5	231
cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser 1	5	10	276
aaa gaa tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp 15	20	25	321
aaa gtc cgc aca ggt gtc ttg gtc gat gat ccc aaa atg aag aag Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys 30	35	40	366
cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala 45	50	55	411
gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val 60	65	70	456
gcc agc gac gaa gag gtg gac aag atc gtg cag aag tgc gtg gtc Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val 75	80	85	501
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys 90	95	100	546
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgtttgtta Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp 105	110	115	595
tttgactgaa ttttgacaat aaaggtaata tcgttatgtaa aaaaaaaaaaa		645	
aaaaaaaaactcg agcaccacca ccaccaccac tgagat		681	

<210> 17
<211> 173
<212> PRT

<213> Tenebrio molitor

<223> Precursor Protein with His-tag, Clone 2.2

<400> 17

Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
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-40 -35 -30

Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala
-25 -20 -15

Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile
-10 -5 1 5

Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val
10 15 20

Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp
25 30 35

Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly Val
40 45 50

Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu
55 60 65 70

Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys
75 80 85

Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys
90 95 100

Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp
105 110 115

<210> 18

<211> 543

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, signal minus, Clone 2.2

<400> 18

ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cac agc 96
Met Gly Ser Ser His His His His His His Ser
-30 -25

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
-20 -15 -10

gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag 186
 Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln
 -5 1 5

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aaa agg aac aag atc agc aaa gaa tgc cag-cag gtg tcc gga gtg  231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val
          10          15          20

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tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gat	276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp	
25 30 35	

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gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act    321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr
        40          45          50

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gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa 366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys
      55          60          65

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gcc aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc 411
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile
    70           75           80

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gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct 456
 Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala
 85 90 95

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tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct 501
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser
    100           105           110

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cct att gat taa ctgcgagcacc accaccacca ccactgagat 543
Pro Ile Asp
115

<210> 19
<211> 149
<212> PRT
<213> *Tenebrio molitor*

<223> Mature Protein with His-tag, Clone 2.2

<400> 19
Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
-30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
-15 -10 -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys
1 5 10

Glu	Cys	Gln	Gln	Val	Ser	Gly	Val	Ser	Gln	Glu	Thr	Ile	Asp	Lys	Val
15					20				25					30	

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu
35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn
50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu
65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu
80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp
95 100 105 110

Phe Ser Pro Ile Asp
115

<210> 20

<211> 682

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, Signal Plus, Clone 2.3

<400> 20

ttgttagcgg atgaaattcc ctcgttaggg ataattttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cac agc 96
Met Gly Ser Ser His His His His His His Ser
-55 -50

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
-45 -40 -35

gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg 186
Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met
-30 -25 -20

aaa ctc ctc ttg tgc ttt gct ttc gcc gcc atc gtc atc gga gct 231
Lys Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala
-15 -10 -5

cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc 276
Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser
1 5 10

aaa gaa tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac 321
Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp
15 20 25

aaa gtc cgc aca ggt gtc ttg gtc gat gat ccc aaa atg aag aag 366
Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys
30 35 40

cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc	411
His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala	
45 50 55	
gga gac acc aat gtg gag gta ctc aaa gcc-aag ctg aag cat gtg	456
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val	
60 65 70	
gcc agc gac gaa gaa gtg gac aag atc gtg cag aag tgc gtg gtc	501
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val	
75 80 85	
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt	546
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys	
90 95 100	
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgtttgtta	595
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp	
105 110 115	
tttgactgaa ttttgacaat aaaggtacta tcgttatgaa aaaaaaaaaaa	645
aaaaaaaaactc gagcaccacc accaccacca ctgagat	682

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<210> 21
<211> 173
<212> PRT
<213> Tenebrio molitor

<223> Precursor Protein with His-tag, Clone 2.3

<400> 21
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro
      -55           -50           -45

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
      -40           -35           -30

Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala
      -25           -20           -15

Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile
      -10           -5            1            5

Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val
      10            15            20

Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp
      25            30            35

Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly Val
      40            45            50

Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu
      55            60            65            70

```

Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys
75 80 85

Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys
90 95 100

Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp
105 110 115

<210> 22

<211> 543

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, Signal minus, Clone 2.3

<400> 22

ttgttagcggttggaaattccctcgtaggggataaattttgtttactttaag 50

aaggagatataccatgatggcagcagccatcatcatcatcatcacagc 96
Met Gly Ser Ser His His His His His His Ser
-30 -25

agcggccctgtgtccgcggcagccatatggctagcactggat 141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
-20 -15 -10

ggacagcaaatgggtcgccggatccctaccgacgaaatcag 186
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln
-5 1 5

aaaaggAACaagatcagcAAAgaatgcCAGCAGgtgttccggatgt 231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val
10 15 20

tcccaaGAGACGATCAGCAAAgtcCgcacaGGTgttttcgttgcgtat 276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp
25 30 35

gatcccAAAATGAAAGAACGACgtcctctgttttcgttgcgtat 321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr
40 45 50

ggatgtggcaaccgaaGCCGGAGACACCaatgtgtgaggtatctaaa 366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys
55 60 65

gcc aag ctg aag cat gtg gcc agc gac gaa gaa gtg gac aag atc 411
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile
70 75 80

gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct 456
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala
85 90 95

tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct 501

Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser
100 105 110

cct att gat taa ctcgagcacc accaccacca ccactgagat 543
Pro Ile Asp
115

<210> 23
<211> 149
<212> PRT
<213> Tenebrio molitor

<223> Mature Protein with His-tag, Clone 2.3

<400> 23
Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
-30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
-15 -10 -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys
1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val
15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu
35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn
50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu
65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu
80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp
95 100 105 110

Phe Ser Pro Ile Asp
115

<210> 24
<211> 776
<212> DNA
<213> Tenebrio molitor

<223> His-tagged, Signal plus, Tm 13.17

<400> 24
ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc Met Gly Ser Ser His His His His His His His Ser -65 -60 -55	96
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly -50 -45 -40	141
gga cag caa atg ggt cgc gga tcc gaa ttc tgg atc caa aga att Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Trp Ile Gln Arg Ile -35 -30 -25	186
cgg cac gag act act aag atg aag ttg ctc tgt tgt cta atc tcc Arg His Glu Thr Thr Lys Met Lys Leu Leu Cys Cys Leu Ile Ser -20 -15 -10	231
ctc att ctg ttg gtc aca gtt cag gcc ctg acc gag gca caa att Leu Ile Leu Leu Val Thr Val Gln Ala Leu Thr Glu Ala Gln Ile -5 1 5	276
gag aaa ctg aac aag atc agc aaa aaa tgt caa aat gaa agt gga Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly 10 15 20	321
gtg tcg caa gag atc ata acc aaa gct cgc aac ggt gac tgg gag Val Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu 25 30 35	366
gac gat cct aaa ctg aaa cgc caa gtt ttt tgc gtg gcc agg aac Asp Asp Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn 40 45 50	411
gcc ggt ctg gcc acg gaa tcg gga gag gtg gtg gtc gac gtg ttg Ala Gly Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu 55 60 65	456
agg gag aag gtg agg aag gtc act gac aac gac gaa gaa act gag Arg Glu Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu 70 75 80	501
aaa atc atc aat aag tgc gcc gtc aag aga gat act gtt gaa gag Lys Ile Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu 85 90 95	546
acg gtg ttc aat act ttc aaa tgt gtc atg aaa aac aag cca aag Thr Val Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys 100 105 110	591
ttc tca cca gtt gat tga accaccacga ctagtagatg gttcaaatgg Phe Ser Pro Val Asp 115	639
tgtgctttac atataaaaat aaagtgtttc tgatgtaaaa aaaaaaaaaaa aaaaaaaaaaa aactcgagag tattctagag cggccgcggg cccatcgttt	689
aaaaaaaaaaa aactcgagag tattctagag cggccgcggg cccatcgttt	739

tccaccctc gagcaccacc accaccacca ctgagat

776

<210> 25
<211> 174
<212> PRT
<213> Tenebrio molitor

<223> Precursor Protein with His-tag, Tm 13.17

<400> 25
Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
-55 -50 -45

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
-40 -35 -30

Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Cys Cys Leu Ile
-25 -20 -15

Ser Leu Ile Leu Leu Val Thr Val Gln Ala Leu Thr Glu Ala Gln Ile
-10 -5 1 5

Glu Lys Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly Val
10 15 20

Ser Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu Asp Asp
25 30 35

Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn Ala Gly Leu
40 45 50

Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu Arg Glu Lys Val
55 60 65 70

Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu Lys Ile Ile Asn Lys
75 80 85

Cys Ala Val Lys Arg Asp Thr Val Glu Glu Thr Val Phe Asn Thr Phe
90 95 100

Lys Cys Val Met Lys Asn Lys Pro Lys Phe Ser Pro Val Asp
105 110 115

<210> 26
<211> 543
<212> DNA
<213> Tenebrio molitor

<223> His-tagged, Signal minus, Tm 13.17

<400> 26
ttgttagcgg atgaaattcc ctcgtagggg ataatttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cac agc 96
Met Gly Ser Ser His His His His His Ser

-30	-25	
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly		141
-20	-15	-10
gga cag caa atg ggt cgc ggc ctg acc gag gca caa att gag aaa Gly Gln Gln Met Gly Arg Gly Leu Thr Glu Ala Gln Ile Glu Lys		186
-5	1	5
ctg aac aag atc agc aaa aaa tgt caa aat gaa agt gga gtg tcg Leu Asn Lys Ile Ser Lys Lys Cys Gln Asn Glu Ser Gly Val Ser		231
10	15	20
caa gag atc ata acc aaa gct cgc aac ggt gac tgg gag gac gat Gln Glu Ile Ile Thr Lys Ala Arg Asn Gly Asp Trp Glu Asp Asp		276
25	30	35
cct aaa ctg aaa cgc caa gtt ttt tgc gtg gcc agg aac gcc ggt Pro Lys Leu Lys Arg Gln Val Phe Cys Val Ala Arg Asn Ala Gly		321
40	45	50
ctg gcc acg gaa tcg gga gag gtg gtg gtc gac gtg ttg agg gag Leu Ala Thr Glu Ser Gly Glu Val Val Val Asp Val Leu Arg Glu		366
55	60	65
aag gtg agg aag gtc act gac aac gac gaa act gag aaa atc Lys Val Arg Lys Val Thr Asp Asn Asp Glu Glu Thr Glu Lys Ile		411
70	75	80
atc aat aag tgc gcc gtc aag aga gat act gtt gaa gag acg gtg Ile Asn Lys Cys Ala Val Lys Arg Asp Thr Val Glu Glu Thr Val		456
85	90	95
ttc aat act ttc aaa tgt gtc atg aaa aac aag cca aag ttc tca Phe Asn Thr Phe Lys Cys Val Met Lys Asn Lys Pro Lys Phe Ser		501
100	105	110
cca gtt gat tga ctcgagcacc accaccacca ccactgagat Pro Val Asp		543
115		

<210> 27

<211> 149

<212> PRT

<213> Tenebrio molitor

<223> Mature Protein with His-tag, Tm 13.17

<400> 27

Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
-30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
-15 -10 -5

Gly	Leu	Thr	Glu	Ala	Gln	Ile	Glu	Lys	Leu	Asn	Lys	Ile	Ser	Lys	Lys
1															15
Cys	Gln	Asn	Glu	Ser	Gly	Val	Ser	Gln	Glu	Ile	Ile	Thr	Lys	Ala	Arg
															30
Asn	Gly	Asp	Trp	Glu	Asp	Asp	Pro	Lys	Leu	Lys	Arg	Gln	Val	Phe	Cys
															45
Val	Ala	Arg	Asn	Ala	Gly	Leu	Ala	Thr	Glu	Ser	Gly	Glu	Val	Val	Val
															60
Asp	Val	Leu	Arg	Glu	Lys	Val	Arg	Lys	Val	Thr	Asp	Asn	Asp	Glu	Glu
															75
Thr	Glu	Lys	Ile	Ile	Asn	Lys	Cys	Ala	Val	Lys	Arg	Asp	Thr	Val	Glu
80															95
Glu	Thr	Val	Phe	Asn	Thr	Phe	Lys	Cys	Val	Met	Lys	Asn	Lys	Pro	Lys
															110
Phe	Ser	Pro	Val	Asp											
															115

<210>	28															
<211>	681															
<212>	DNA															
<213>	Tenebrio molitor															
<223>	His-tagged, Signal plus, Clone 3.4															
<400>	28															
ttgttagcgg	atggaattcc	ctcgttagggg	ataattttgt	ttactttaag											50	
aaggagatat	acc	atg	ggc	agc	agc	cat	cat	cat	cat	cat	cac	agc			96	
	Met	Gly	Ser	Ser	His	Ser										
															-50	
															-55	
agc	ggc	ctg	gtg	ccg	cgc	ggc	agc	cat	atg	gct	agc	atg	act	ggt		141
Ser	Gly	Leu	Val	Pro	Arg	Gly	Ser	His	Met	Ala	Ser	Met	Thr	Gly		
															-45	
															-40	
															-35	
gga	cag	caa	atg	ggt	cgc	gga	tcc	gaa	ttc	gca	cga	gca	aaa	atg		186
Gly	Gln	Gln	Met	Gly	Arg	Gly	Ser	Glu	Phe	Ala	Arg	Ala	Lys	Met		
															-30	
															-25	
															-20	
aaa	ctc	ctc	ttg	tgc	ttt	gct	ttc	gcc	gcc	atc	gtc	atc	gga	gct		231
Lys	Leu	Leu	Leu	Cys	Phe	Ala	Phe	Ala	Ala	Ile	Val	Ile	Gly	Ala		
															-15	
															-10	
															-5	
cag	gct	ctc	acc	gac	gaa	cag	ata	cag	aaa	agg	aac	aag	atc	agc		276
Gln	Ala	Leu	Thr	Asp	Glu	Gln	Ile	Gln	Lys	Arg	Asn	Lys	Ile	Ser		
															1	
															5	
															10	
aaa	gaa	tgc	cag	cag	gtg	tcc	gga	gtg	tcc	caa	gag	acg	atc	gac		321
Lys	Glu	Cys	Gln	Gln	Val	Ser	Gly	Val	Ser	Gln	Glu	Thr	Ile	Asp		

15	20	25	
aaa gtc cgc aca ggt gtc ttg gtc gac gat ccc aaa atg aag aag			366
Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys			
30	35	40	
cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc			411
His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala			
45	50	55	
gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg			456
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val			
60	65	70	
gcc agc gac gaa gag gtg gac aag atc gtg cag aag tgc gtg gtc			501
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val			
75	80	85	
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag gtt			546
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Val			
90	95	100	
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgtttgtta			595
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp			
105	110	115	
tttgactgaa tttgacaat aaaggtacta tcgttatgta aaaaaaaaaaa			645
aaaaaaaaactcg agcaccacca ccaccaccac tgagat			681
<210> 29			
<211> 173			
<212> PRT			
<213> Tenebrio molitor			
<223> Precursor protein with His-tag, Clone 3.4			
<400> 29			
Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro			
-55	-50	-45	
Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg			
-40	-35	-30	
Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala			
-25	-20	-15	
Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile			
-10	-5	1	5
Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val			
10	15	20	
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp			
25	30	35	

Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly Val
40 45 50

Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu
55 60 65 70

Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys
75 80 85

Val Val Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys
90 95 100

Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp
105 110 115

<210> 30

<211> 543

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, Signal minus, Clone 3.4

<400> 30

ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag 50

aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc 96
Met Gly Ser Ser His His His His His His His Ser
-30 -25

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
-20 -15 -10

gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag 186
Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln
-5 1 5

aaa agg aac aag atc agc aaa gaa tgc cag cag gtg tcc gga gtg 231
Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val
10 15 20

tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac 276
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp
25 30 35

gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act 321
Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr
40 45 50

gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa 366
Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys
55 60 65

gcc aag ctg aag cat gtg gcc agc gac gaa gag gtg gac aag atc 411
Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile
70 75 80

gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct	456
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala	
85	90
95	

tat gac acc ttc aag gtt att tac gac agt aaa cct gat ttc tct	501
Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp Phe Ser	
100	105
110	

cct att gat taa ctcgagcacc accaccacca ccactgagat	543
Pro Ile Asp	
115	

<210> 31
<211> 149
<212> PRT
<213> Tenebrio molitor

<223> Mature Protein with His-tag, Clone 3.4

<400> 31	
Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro	
-30	-25
	-20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg	
-15	-10
	-5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys	
1	5
	10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val	
15	20
	25
	30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu	
35	40
	45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn	
50	55
	60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu	
65	70
	75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu	
80	85
	90

Glu Thr Ala Tyr Asp Thr Phe Lys Val Ile Tyr Asp Ser Lys Pro Asp	
95	100
	105
	110

Phe Ser Pro Ile Asp
115

<210> 32
<211> 682
<212> DNA
<213> Tenebrio molitor

<223> His-tagged, Signal plus, Clone 3.9

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141
 Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
 -20 -15 -10

 gga cag caa atg ggt cgc gga tcc ctc acc gat gaa cag ata cag 186
 Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln
 -5 1 5

 aaa agg aac aag atc agc aaa gaa tgc cag cag gag tcc gga gtg 231
 Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val
 10 15 20

 tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac 276
 Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp
 25 30 35

 gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aga act 321
 Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Arg Thr
 40 45 50

 gga gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa 366
 Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys
 55 60 65

 gcc aag ctg aag cat gtg gcc agc gac gaa gaa gtg gac aag atc 411
 Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile
 70 75 80

 gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct 456
 Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala
 85 90 95

 tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct 501
 Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser
 100 105 110

 cct att gat taa ctgcagcacc accaccacca ccactgagat 543
 Pro Ile Asp
 115

 <210> 35
 <211> 149
 <212> PRT
 <213> Tenebrio molitor

 <223> Mature Protein with His-tag, Clone 3.9

 <400> 35
 Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro 886
 -30 -25 -20

 Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
 -15 -10 -5

 Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys

1	5	10
Glu Cys Gln Gln Glu Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val		
15	20	25
Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu		
35	40	45
Cys Phe Ser Lys Arg Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn		
50	55	60
Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu		
65	70	75
Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu		
80	85	90
Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp		
95	100	105
Phe Ser Pro Ile Asp		
115		

<210>	36	
<211>	681	
<212>	DNA	
<213>	Tenebrio molitor	
<223> His-tagged, Signal plus, Clone 7.5		
<400>	36	
ttgttagcgg atggaattcc ctcgtagggg ataattttgt ttactttaag		50
aaggagatat acc atg ggc agc agc cat cat cat cat cat cac agc		96
Met Gly Ser Ser His His His His His His Ser		
-55		-50
agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt		141
Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly		
-45		-40
-35		
gga cag caa atg ggt cgc gga tcc gaa ttc gca cga gca aaa atg		186
Gly Gln Gln Met Gly Arg Gly Ser Glu Phe Ala Arg Ala Lys Met		
-30		-25
-20		
aaa ctc ctc ttg tgc ttt gcg ttc gcc gcc atc gtc atc gga gct		231
Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala Ile Val Ile Gly Ala		
-15		-10
-5		
cag gct ctc acc gac gaa cag ata cag aaa agg aac aag atc agc		276
Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser		
1		5
10		
aaa gag tgc cag cag gtg tcc gga gtg tcc caa gag acg atc gac		321
Lys Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp		
15		20
25		

aaa gtc cgc aca ggt gtc ttg gtc gac gat ccc aaa atg aag aag	366
Lys Val Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys	
30 35 40	
cac gtc ctc tgc ttc tcg aag aaa act gga gtg gca acc gaa gcc	411
His Val Leu Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala	
45 50 55	
gga gac acc aat gtg gag gta ctc aaa gcc aag ctg aag cat gtg	456
Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu Lys His Val	
60 65 70	
gcc agc gac gaa gag gtg gac aag atc gtg cag aag tgc gtg gtc	501
Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys Val Val	
75 80 85	
aag aag gcc aca cca gag gaa acg gct tat gac acc ttc aag tgt	546
Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys Cys	
90 95 100	
att tac gac agt aaa cct gat ttc tct cct att gat taa ttgtttgtta	595
Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp	
105 110 115	
tttggctgaa ttttgacaat aaaggtacta tcgttatgta aaaaaaaaaaa	645
aaaaaaactcg agcaccacca ccaccaccac tgagat	681
<210> 37	
<211> 173	
<212> PRT	
<213> Tenebrio molitor	
<223> Precursor Protein with His-tag, Clone 7.5	
<400> 37	
Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro	
-55 -50 -45	
Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg	
-40 -35 -30	
Gly Ser Glu Phe Ala Arg Ala Lys Met Lys Leu Leu Leu Cys Phe Ala	
-25 -20 -15	
Phe Ala Ala Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile	
-10 -5 1 5	
Gln Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val	
10 15 20	
Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp	

25

30

35

Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly Val
 40 45 50

Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala Lys Leu
 55 60 65 70

Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val Gln Lys Cys
 75 80 85

Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr Asp Thr Phe Lys
 90 95 100

Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro Ile Asp
 105 110 115

<210> 38

<211> 543

<212> DNA

<213> Tenebrio molitor

<223> His-tagged, Signal minus, Clone 7.5

<400> 38

ttgttagcggtatggattccctcgtaggggataattttgtttactttaag 50

aaggagatataccatg ggc agc agc cat cat cat cat cat cac agc 96
 Met Gly Ser Ser His His His His His His His Ser
 -30 -25

agc ggc ctg gtg ccg cgc ggc agc cat atg gct agc atg act ggt 141
 Ser Gly Leu Val Pro Arg Gly Ser His Met Ala Ser Met Thr Gly
 -20 -15 -10

gga cag caa atg ggt cgc gga tcc ctc acc gac gaa cag ata cag 186
 Gly Gln Gln Met Gly Arg Gly Ser Leu Thr Asp Glu Gln Ile Gln
 -5 1 5

aaa agg aac aag atc agc aaa gag tgc cag cag gtg tcc gga gtg 231
 Lys Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val
 10 15 20

tcc caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gac 276
 Ser Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp
 25 30 35

gat ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag aaa act 321
 Asp Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr
 40 45 50

gga gtg gca acc gaa gcc gga gac acc aat gtc gag gta ctc aaa 366
 Gly Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys
 55 60 65

gcc aag ctg aag cat gtc gcc agc gac gaa gag gtc gac aag atc 411

Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile
 70 75 80

gtg cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct
 Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala
 85 90 95

tat gac acc ttc aag tgt att tac gac agt aaa cct gat ttc tct
 Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser
 100 105 110

cct att gat taa ctcgagcacc accaccacca ccactgagat
 Pro Ile Asp
 115

<210> 39
 <211> 149
 <212> PRT
 <213> Tenebrio molitor

<223> Mature protein with His-tag, Clone 7.5

<400> 39
 Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
 -30 -25 -20

Arg Gly Ser His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
 -15 -10 -5

Gly Ser Leu Thr Asp Glu Gln Ile Gln Lys Arg Asn Lys Ile Ser Lys
 1 5 10

Glu Cys Gln Gln Val Ser Gly Val Ser Gln Glu Thr Ile Asp Lys Val
 15 20 25 30

Arg Thr Gly Val Leu Val Asp Asp Pro Lys Met Lys Lys His Val Leu
 35 40 45

Cys Phe Ser Lys Lys Thr Gly Val Ala Thr Glu Ala Gly Asp Thr Asn
 50 55 60

Val Glu Val Leu Lys Ala Lys Leu Lys His Val Ala Ser Asp Glu Glu
 65 70 75

Val Asp Lys Ile Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu
 80 85 90

Glu Thr Ala Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp
 95 100 105 110

Phe Ser Pro Ile Asp
 115

<210> 40
 <211> 24

<212> DNA
<213> Tenebrio molitor

<223> Tm 12.84 upper primer with Bam-H1 site (Clones 2.2, 2.3, 3.4, 3.9, and 7.5)

<400> 40
cgcgatccc tcaccgacga acag 24

<210> 41
<211> 25
<212> DNA
<213> Tenebrio molitor

<223> Tm 12.84 lower primer with Xho1 site (Clones 2.2, 2.3, 3.4, 3.9, and 7.5)

<400> 41
gagaggataa ctaattgagc tcgcc 25

<210> 42
<211> 24
<212> DNA
<213> Tenebrio molitor

<223> Tm 13.17 upper primer with Bam-H1 site

<400> 42
cgcgatccc tgaccgaggc acaa 24

<210> 43
<211> 25
<212> DNA
<213> Tenebrio molitor

<223> Tm 13.17 lower primer with Xho1 site

<400> 43
gagtggtaa ctaactgagc tcgcc 25

<210> 44
<211> 481
<212> DNA
<213> Tenebrio molitor

<220>
<221> misc_feature
<222>
<223> Consensus of the Tm 12.84 Isoforms, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid.

<400> 44
ggcacgagca aaa atg aaa ctc ctc ttg tgc ttt gcn ttc gcc gcc 46

Met Lys Leu Leu Leu Cys Phe Ala Phe Ala Ala		
-15	-10	
atc gtc atc gga gct cag gct ctc acc gay gaa cag ata cag aaa		91
Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys		
-5	1	5
agg aac aag atc agc aaa gar tgc cag cag gng tcc gga gtg tcc		136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Xaa Ser Gly Val Ser		
10	15	20
caa gag acg atc gac aaa gtc cgc aca ggt gtc ttg gtc gay gat		181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp		
25	30	35
ccc aaa atg aag aag cac gtc ctc tgc ttc tcg aag ara act gga		226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly		
40	45	50
gtg gca acc gaa gcc gga gac acc aat gtg gag gta ctc aaa gcc		271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala		
55	60	65
aag ctg aag cat gtg gcc agc gac gaa gar gtg gac aag atc gtg		316
Lys Leu Lys His Val Ala Ser Asp Glu Glu Val Asp Lys Ile Val		
70	75	80
cag aag tgc gtg gtc aag aag gcc aca cca gag gaa acg gct tat		361
Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala Tyr		
85	90	95
gac acc ttc aag nnt att tac gac agt aaa cct gat ttc tct cct		406
Asp Thr Phe Lys Xaa Ile Tyr Asp Ser Lys Pro Asp Phe Ser Pro		
100	105	110
att gat taa ttgtttgtta tttgrctgaa ttttgacaat aaaggtanta		455
Ile Asp		
115		
tcgttatgna aaaaaaaaaa aaaaaaa		481
<210> 45		
<211> 484		
<212> DNA		
<213> Tenebrio molitor		
<220>		
<221> misc_feature		
<222>		
<223> Consensus of Seq ID #44 with Tm 13.17, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid		
<400> 45		
ggcanrnnnn aar atg aar ytn ctc tnn tgy ytn ryn tyc nyc ryy		46
Met Lys Leu Leu Xaa Cys Phe Ala Phe Ala Ala		
-15	-10	

ntn ntn rtc rna gyt cag gcy ctn acc gan gna car atn nag aaa Xaa Xaa Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys -5 1 5	91
nng aac aag atc agc aaa rar tgy car nan gnr nny gga gtg tcn Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser 10 15 20	136
caa gag ayn atn rnc aaa gyy cgc ann ggt gnc tng gnn gay gat Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp 25 30 35	181
ccy aaa ntg aar nrn can gty yty tgc ntn ncn arg arn rcy ggn Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly 40 45 50	226
ntg gcn acn gaa ncn gga gan ryn rnn gtn gan gtr ytn arr gnn Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala 55 60 65	271
aag ntg arg nan gtn rcy rrc aac gac gaa gar ryn gan aar atc Lys Leu Lys His Val Ala Ser Asn Asp Glu Glu Val Asp Lys Ile 70 75 80	316
rtn nan aag tgc gyn gtc aag arr gny acn nyn gar gar acg gyn Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala 85 90 95	361
tny ray acy ttc aar nnt rty nnn ran ary aar ccn ran ttc tcn Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser 100 105 110	406
ccn rtt gat tra nynnyynnna ytngnnnrnr nttyranaat aaagnnnntn Pro Ile Asp 115	458
tnrtnnnrna aaaaaaaaaa aaaaaa	484
<210> 46 <211> 484 <212> DNA <213> Tenebrio molitor	
<220> <221> misc_feature <222> <223> Consensus of Seq ID #45 with B1/B2, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid,	
<400> 46 ggcanrnnnn aar atg aar ytn ctc tnn tgy ytn ryn tyy nyc ryy Met Lys Leu Leu Cys Phe Ala Phe Ala Ala -15 -10	

ntn ntn rtc nna gyt cag gcy ntn acy nan gna nan ntn nag nna Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys -5 1 5	91
nng nnc nar ayc agc rna rar tgy nar nnn gnr nny gga gtg tcn Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Val Ser Gly Val Ser 10 15 20	136
naa gan ryn atn rnn ara gyy cgc ann ggt gnc tng gnn gay gay Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp 25 30 35	181
ccy aaa ntg aar nnn can nty yty tgc ntn nyn arg rnn nyy grn Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly 40 45 50	226
ntr gyn rcn gaa ncn gga gan ryn rnn gyn gan ryr ytn arr gnn Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala 55 60 65	271
aag ntg ang nrn nnn nnn rnn ann rnn rar rar ryn rrr arr ntn Lys Leu Lys His Val Ala Ser Asn Asp Glu Glu Val Asp Lys Ile 70 75 80	316
ynn nrn arn nnn nnn nnn nng arn rnn nyn nnn rar rnr nnn nnn Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala 85 90 95	361
tnn ran nyn yyn aan nnn nny nnn rrr ann arn ccn rnn tyy tyn Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser 100 105 110	406
cnn ryt rnt trn nynnnnnnnn ynngnnnrnr nttyranaat aaagnnnytn Pro Ile Asp 115	458
tnrtnnnrna aaaaaaaaaa aaaaaa	484
<210> 47 <211> 484 <212> DNA <213> Tenebrio molitor	
<220> <221> misc_feature <222> <223> Consensus of SEQ. ID #46 with AFP-3, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid	
<400> 47 ggcnnnnnnn aar atg aar ytn ctc ynn tgy ytn ryn yyy nyy ryy Met Lys Leu Leu Cys Phe Ala Phe Ala Ala -15 -10	
ntn ntn ryc nnr ryy yan gcy ntn acy nan rna nnn nnn nag nnr	

Ile Val Ile Gly Ala Gln Ala Leu Thr Asp Glu Gln Ile Gln Lys			
-5	1	5	
nng nny nar nnc agc rnn rnn tgy nar nnn gnr nny gga gtr tcn			136
Arg Asn Lys Ile Ser Lys Glu Cys Gln Gln Glu Ser Gly Val Ser			
10	15	20	
nna gan nyn ntn rnn arr gyy cgc ann ngt gnn nnr gnn gay gay			181
Gln Glu Thr Ile Asp Lys Val Arg Thr Gly Val Leu Val Asp Asp			
25	30	35	
ccy aaa ntg aar nnn can nyy yty tgc ntn nyn arg rnn nyy grn			226
Pro Lys Met Lys Lys His Val Leu Cys Phe Ser Lys Lys Thr Gly			
40	45	50	
ntn ryn rnn gnn nnn ggn gan nyn nnn nyn gan nnn ntn arr rnn			271
Val Ala Thr Glu Ala Gly Asp Thr Asn Val Glu Val Leu Lys Ala			
55	60	65	
aar ntn ang nrn nnn nnn rnn rnn nnn rar rar ryn rrr rrr ntn			316
Lys Leu Lys His Val Ala Ser Asn Asp Glu Glu Val Asp Lys Ile			
70	75	80	
nyr nnn arn nnn nnn nnn nng arn rnn nyn nnn nar nnn nnn nnn			361
Val Gln Lys Cys Val Val Lys Lys Ala Thr Pro Glu Glu Thr Ala			
85	90	95	
nnn ran nyn yyn aan nnn nny rrr ann arn arn ycn nnn tnn nnn			406
Tyr Asp Thr Phe Lys Cys Ile Tyr Asp Ser Lys Pro Asp Phe Ser			
100	105	110	
cnn nyn rnn trn nnnnnnnnnn ynnrnnnnnn nnnnnnnnaat aaannnnnn			458
Pro Ile Asp			
115			
nnnnnnnnna aaaaaaaaaa aaaaaaa			484

<210> 48
<211> 136
<212> PRT
<213> Tenebrio molitor

<220>
<221> misc_feature
<222>
<223> General Consensus of Clones, B1, B2 and AFP-3, 'n' defined as any nucleotide, 'Xaa' defined as any amino acid

<400> 48
Met Lys Leu Leu Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
-15 -10 -5

Xaa Ala Xaa Thr Xaa Xaa Xaa Xaa Glx Xaa Xaa Xaa Xaa Xaa Ser Xaa
1 5 10

Xaa Cys Xaa Xaa Xaa Ser Gly Xaa Ser Glx Xaa Xaa Xaa Xaa Xaa Xaa
15 20 25 30

Arg Xaa Xaa Xaa Xaa Xaa Asp Asp Pro Lys Xaa Lys Xaa Xaa Xaa Xaa
35 40 45

Cys Xaa Gly Xaa Xaa Xaa
50 55 60

Xaa Xaa Xaa Xaa Xaa Xaa Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Glu
65 70 75

Xaa Xaa Xaa Xaa Xaa Xaa Lys Cys Xaa Val Xaa Xaa Xaa Thr Xaa
80 85 90

Glx Xaa Xaa Xaa Xaa Xaa Xaa Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa
95 100 105 110

Xaa Phe Xaa Xaa Xaa Xaa Xaa Xaa
115